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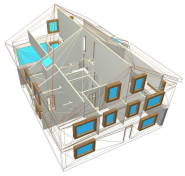
[1] Escuela Universitaria de Ingenieros Técnicos Industriales, Universidad Politécnica de Madrid
[2] Escuela Politécnica Superior, Universidad Alfonso X el Sabio, Villanueva de la Cañada, Madrid

ENERGY EFFICIENCY: Comparisson between the CALENER certificate and real consumptions

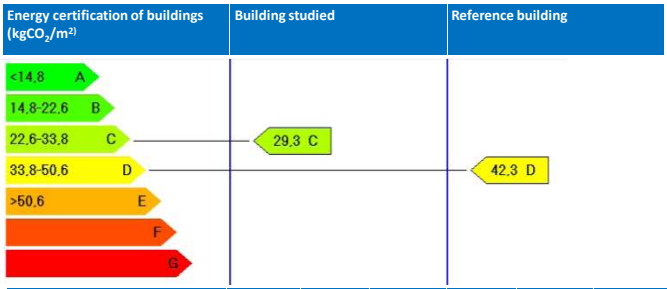
Energy certification obtention



By means of the CALENER software promoted by the Ministry of Inudstry, Torurisim and Commerce through the IDEA and the General Direction of Arquitecture and House of the Ministry of Housing, we have obtained the energy label that classified the single-family house that is object of this study.

The real installations were respected, a mixed sistem of air-to-water heat pump, with Sanitary Hot Water (SHW) accumulated in a deposit of 300 liters.

In the table are shown the results obtaiend by CALENER. Energy consumptions final and early are shown together with the CO2 emissions corresponding to the calefaction systems and SHW



	Class	KWh/m²	KWh/year	Class	KWh/m²	KWh/year
Heating demand	C	71,8	18667,2	D	116,5	30288,8
Refrigeration demand	-	-	-	-	-	-
	Class	**KWh/m2**	**KWh/year**	**Class**	**KWh/m2**	**KWh/year**
Heating CO_2 emissions	A	6,3	1637,9	D	37,3	9697,6
Cooling CO_2 emissions	-	-	-	-	-	-
SHW CO_2 emissions	E	23,0	5979,8	D	5,0	1299,9
Total CO_2 emissions			7617,7			10997,6

Estimation and analysis of consumptions

Electric invoices were gathered together with the data of the contador of the last year

Monthly consumptions (deduced from invoices)			
Month	kWh	Month	kWh
Jan	2224,00	Jul	590,00
Feb	2100,00	Aug	570,00
Mar	1540,00	Sep	765,00
Apr	1100,00	Oct	900,00
May	814,00	Nov	1156,00
Jun	550,00	Dec	1945,00
		Year	**14254,0**

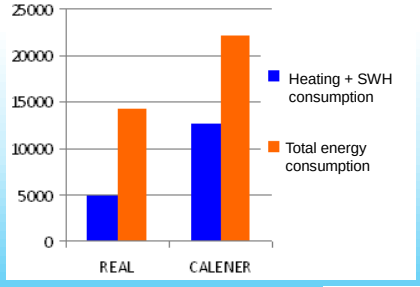
REAL data	**Real Final Energy Consumption (invoices)**	**14254 kWh/year**
	Final Energy consumption heating + SHW real (counter)	**4866 kWh/year**
CALENER data	**Final Energy Consumption (Calener)**	**22010,2 kWh/year**
	Heating consumption + SHW (Calener)	**12622,2 kWh/year**

	Building studied		Reference building	
Demand	**kWh/m2**	**kWh/year**	**kWh/m2**	**kWh/year**
Heating	71,8	18667,2	116,5	30288,8
Cooling	0,0	0,0	0,0	0,0
	Building studied		**Reference building**	
Final Energy Consumptions	**kWh/m2**	**kWh/year**	**kWh/m2**	**kWh/year**
Heating	13,1	3397,0	155,7	40473,7
Cooling	0,0	0,0	0,0	0,0
SHW	35,5	9225,2	23,5	6098,8
Total	48,6	12622,2	179,1	46572,4
	Building studied		**Reference building**	
Primary Energy Consumptions	**kWh/m2**	**kWh/year**	**kWh/m2**	**kWh/year**
Heating	24,7	6432,8	168,9	43909,5
Cooling	0,0	0,0	0,0	0,0
SHW	92,4	24013,2	20,6	5351,5
Total	117,1	30446,0	189,5	49261,0
	Building studied		**Reference building**	
Primary Energy Consumptions	**kWh/m2**	**kWh/year**	**kWh/m2**	**kWh/year**
Heating	6,3	1637,9	37,3	9697,6
Cooling	0,0	0,0	0,0	0,0
SHW	23,0	5979,8	5,5	1299,9
Total	29,3	7617,7	42,3	10997,6

Conclusions

Differences between the CALENER estimations and the real data collected have been observed. This differences are due to:

The rates of occupancy and consumption, in terms of SWH do not match with the estimated by CALENER.
The performance of the equipment estimated by CALENER do not match with the real ones.
The control parameters estimated by CALENER for confort do not match with those that normally are used by the consumers (20ºC -21ºC).
The existence of a wood-burning fireplace in the basement that allows to heat the house in the coolest days.
The heater is switched off in the mild months; the index of confort are acceptable thanks to the solar gain and the quality of the materials used.



M. Islán [1], M.Serrano [2], L.Abad [2], D.Colorado [2], L.Couceiro [2]
email: manuel.islan.marcos@upm.es